

California Regional Water Quality Control Board
Santa Ana Region

April 30, 2004

ITEM: 18

SUBJECT: Proposal by Pyro Spectaculars, Inc., to form the Rialto Environmental Assessment Partnership (REAP)

DISCUSSION:

Pyro Spectaculars, Inc. has approached Board staff with a proposal to form the REAP, in lieu of conducting the separate investigation and cleanup activities that would be required at the 5-acre Astro Pyrotechnics site in Rialto under Cleanup and Abatement Order No. R8-2004-0042. The proposed partnership would sponsor a demonstration project for removal of perchlorate from the soil and groundwater in the vicinity of the 5-acre site. Attached is a copy of a summary of the REAP proposal that was submitted by Pyro Spectaculars, Inc. As noted in the attachment, Pyro Spectaculars, Inc. requests that the hearing on Cleanup and Abatement Order No. R8-2004-0042 be continued for 45-60 days to allow the parties additional time to develop the REAP proposal.

At the April 30, 2004 Board meeting, Pyro Spectaculars will provide a more detailed presentation about the REAP proposal to the Board. Board staff has also distributed information regarding REAP to interested parties and invited them to present comments to the Board on this matter. Letters regarding REAP have been received from the Cities of Rialto and San Bernardino, and copies of those letters are attached.

SUMMARY OF RIALTO ENVIRONMENTAL ASSESSMENT PROJECT **("REAP")**

Pyro Spectaculars, Inc. and Astro Pyrotechnics (collectively, "Pyro") have proposed to participate in a perchlorate remediation demonstration project at 2298 West Stonehurst Drive in Rialto, California (the "Stonehurst Site"). On March 16, 2004, Regional Board staff met with representatives of Pryo, Whittaker Corporation ("Whittaker"), and Tom Peters ("Peters"), at which time Pryo provided an initial briefing on the Rialto Environmental Assessment Partnership ("REAP"). Whittaker and Peters have expressed interest in participating in the REAP project. Other potentially responsible parties, as well as local affected agencies, have also been invited to participate in the REAP project.

On March 29, 2004, Regional Board staff transmitted a draft Cleanup and Abatement Order ("CAO") for the Stonehurst Site to Pyro, Whittaker and Peters, which is scheduled to be considered for adoption at the Regional Board meeting on April 30, 2004. Pyro, Whittaker and Peters propose to conduct the REAP project in lieu of conducting the investigation and cleanup that would be required pursuant to the draft CAO. Pyro has advised that it is prepared to shut down its manufacturing operations at the Stonehurst Site to facilitate implementation of the REAP project at this facility, owned by Mr. Peters. Peters and Whittaker, as well as other project partners, would also be asked to contribute financially in support of the project.

Pyro, Whittaker and Peters have requested that the decision by the Regional Board whether to adopt the draft CAO be continued for a reasonable period of time (Pyro has suggested 45-60 days) to allow the parties some additional time to continue efforts to achieve their stated goal of formalizing a participation agreement amongst the REAP project partners. They have expressed a willingness to provide the Regional Board with an implementation schedule within thirty (30) days, and regular progress reports to keep staff and the Board apprised of their efforts.

A technical meeting involving Pyro, Whittaker, Peters and Regional Board staff was held on April 14, 2004, at which time Kleinfelder, Inc. provided details regarding the proposed remedial technologies in connection with the REAP project. A draft of the preliminary REAP proposal, as well as Kleinfelder's technical presentation, are posted on the Regional Board's Internet site. Further discussion of the REAP project have been included as an agenda item for the April 30 meeting, so that the Board can consider comments on the proposal from interested parties. Additionally, Kleinfelder has expressed its willingness to discuss technical details of the project with interested parties both prior to or following the April 30 meeting.

With regard to comments concerning the REAP project from affected community stakeholders and agencies, to date the Regional Board has received a letter from the City of Rialto expressing support for those "PRP's that step up to their responsibility to remediate the perchlorate plume that is impacting our community. This is a very recent proposal and a concept that is of positive interest to the City." Pyro advises that similar expressions of support for the REAP project have been communicated by other affected agencies, and that they anticipate additional written comments to that effect will be submitted prior to the April 30 meeting.



City of Rialto

CALIFORNIA

2004 APR -1 11:06

HES 4/2
DON

March 23, 2004

Gerard J. Thibeault
California Regional Water Quality Control Board,
Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3348

Subject: Proposed Formation of the Rialto Environmental Assessment Partnership ("REAP")

Dear Mr. Thibeault:

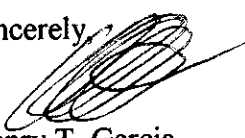
We have been contacted by Mr. Bruce Cash regarding his interest in forming a coalition of interested parties that will focus their efforts toward the eventual remediation of the perchlorate groundwater problem in the Rialto-Colton Basin.

From what we understand, the central element of the REAP concept is a regional cooperative response to a multiple PRP environmental problem. Their first proposal is to perform a perchlorate remediation demonstration project at the Astro Pyrotechnics property at 2298 West Stonehurst Drive in Rialto, California.

The City of Rialto supports those PRP's that step up to their responsibility to remediate the perchlorate plume that is impacting our community. This is a very recent proposal and a concept that is of positive interest to the City. We will be watching the REAP group closely and look forward to specific information regarding their membership, funding sources, study objectives, and timelines for subsurface characterization and remediation implementation.

We appreciate the leadership provided by the RWQCB in the Rialto-Colton Basin as we work toward a final solution to the perchlorate problem.

Sincerely,



Henry T. Garcia
City Administrator

cc: Bruce Cash

CITY OF SAN BERNARDINO MUNICIPAL WATER DEPARTMENT

BOARD OF WATER COMMISSIONERS

B. WARREN COCKE
President

Commissioners
JUDITH W. BATTEY
TONI CALLICOTT
MARTIN A. MATICH
NORINE I. MILLER



BERNARD C. KERSEY
General Manager

STACEY R. ALDSTADT
Deputy General Manager

W. WILLIAM BRYDEN, P.E.
Director, Water Utility

JOHN A. PERRY, P.E.
Director, Water Reclamation

DAVID S. ERICKSON
Director, Administration
and Finance

JON K. TURNIPSEED
Safety Program Manager

April 5, 2004

Bruce E. Cash
President and CEO
United Strategies, Inc.
1881 Business Center Drive
Suite 8-A
San Bernardino, CA 92408


RE: DEMONSTRATION PROJECT –RIALTO ENVIRONMENTAL ASSESSMENT PARTNERSHIP

Dear Mr. Cash:

I have reviewed the information you provided regarding a demonstration project to develop a proposed perchlorate remediation demonstration project at the Astro site in Rialto, California. At this time the department will not participate in the coalition.

I am enclosing a draft report prepared by the Office of Pollution Prevention and Technology Development, Department of Toxic Substances Control, California Environmental Protection Agency dated January 2004 titled "Perchlorate Contamination Treatment Alternatives" that may be useful for your proposed demonstration project.

Sincerely,


Bernard C. Kersey
General Manager

BCK:mka
Attachment

cc: Gerard J. Thibeault (w/o attach)



KLEINFELDER

AN EMPLOYEE OWNED COMPANY

> EXPECT MORE.

**Rialto Environmental Assessment Project
(REAP)
Preliminary Technical Presentation**

April 14, 2004



Presentation Outline

- Challenges of Rialto/Colton Plume
- Discussion of the Feasibility of Cleanup
- Summary of Perchlorate Remediation Alternatives
- An Emerging Approach, and the Case for In Situ
Bioremediation Testing
- Conceptual Demonstration Project



Kleinfelder's Perchlorate Task Force

- Formed to assist our clients and their communities with perchlorate concerns
- Integrated “Think Tank” for perchlorate issues- regulatory, political, site investigation, risk assessment, and remediation
- Includes Kleinfelder's top geologists, hydrogeologists, modelers, chemists, engineers and environmental scientists
- Partnered with Dr. Eric Nuttall, a national expert on perchlorate chemistry and remediation from the University of New Mexico





Remediation Challenges of Rialto/Colton Plume

- Three aquifers, a large vadose zone, and deep soil source likely in dry upper aquifer
- Aerially extensive plume
- Historical variations in water levels (58 feet in last four years)
- Difficult to construct wells (lost bits, casings, etc.)
- Heterogeneous stratigraphy with significant inter-fingering of diverse soil layers, aquitards, and anomalous unsaturated aquifer
- Oxygen in groundwater near saturation



Feasibility of Cleanup

- Groundwater plume covers a broad area
- Needs source and boundary cleanup strategy
- Three target areas- vadose zone source, groundwater source, fugitive plume
- Boundary strategy has several advantages
 - Limits site investigation scope, time and costs
 - Limits remediation extent and costs
 - Evaluation of data more straightforward
 - More definitively controls risks

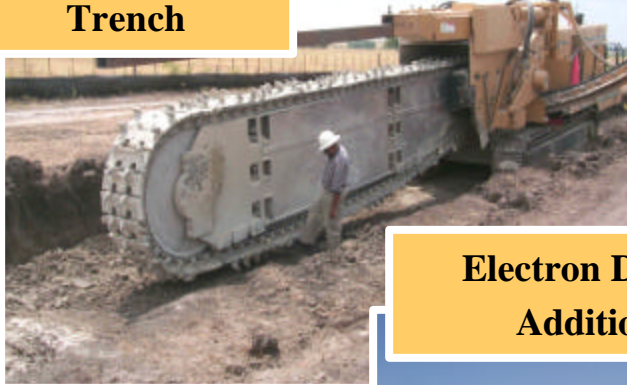


KLEINFELDER

AN EMPLOYEE OWNED COMPANY

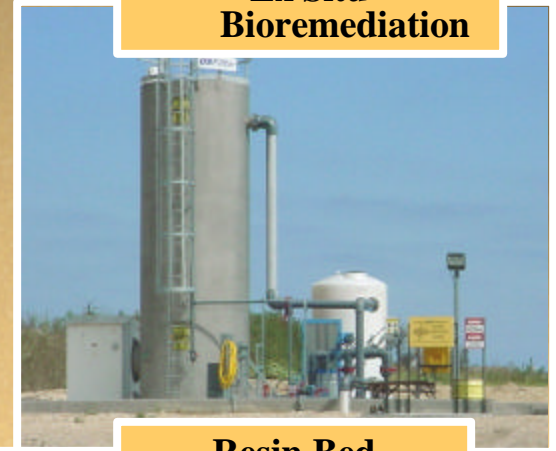
> EXPECT MORE.

**Cut Off
Trench**



Some Perchlorate Remediation Approaches

**Ex Situ
Bioremediation**



**Electron Donor
Addition**



Ex Situ

**Resin Bed
Adsorption**



CWTS IonX Columns

**Permeable Reactive
Barrier**



**Biodegradation
Ponds**



In Situ



Limitations of Current Remediation Technologies

- Many perform poorly in tight soils or fractured bedrock
- Many not feasible for deep plumes/soil contamination
- Extraction-related remediation limitations
 - Bioaccumulation with groundwater extraction, requiring frequent disinfection, chlorine addition to groundwater
 - Scaling of wells with mineral precipitants
 - Poor yield in fine-grained regions, several wells required
 - Uncertainty in heterogeneous soils/ multiple aquifers
- Liquid injection-related limitations
 - Clogging the aquifer with precipitants or biomatter
 - Poor distribution in fine-grained regions or heterogeneous soils



> EXPECT MORE.

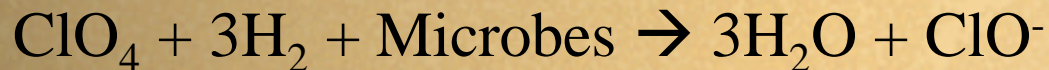
Simplified Perchlorate Biodegradation with Various Electron Donors



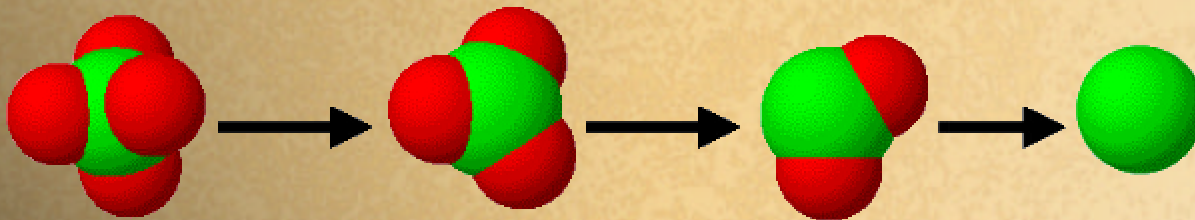
100 lbs Perchlorate : 25 lbs Ethanol : 50 Pounds of Carbon Compounds



100 lbs Perchlorate : 50 lbs Citric Acid : 100 lbs Carbon Compounds



100 lbs Perchlorate : 1 lb Hydrogen : 0 lbs Carbon Compounds



Perchlorate (ClO_4^-)

Chlorate (ClO_3^-)

Chlorite (ClO_2^-)

Chloride (Cl^-)



KLEINFELDER

AN EMPLOYEE OWNED COMPANY

> EXPECT MORE.

Summary Experience - Lab to Field



Direct Push Delivery System



Mixing tanks and feed pumps



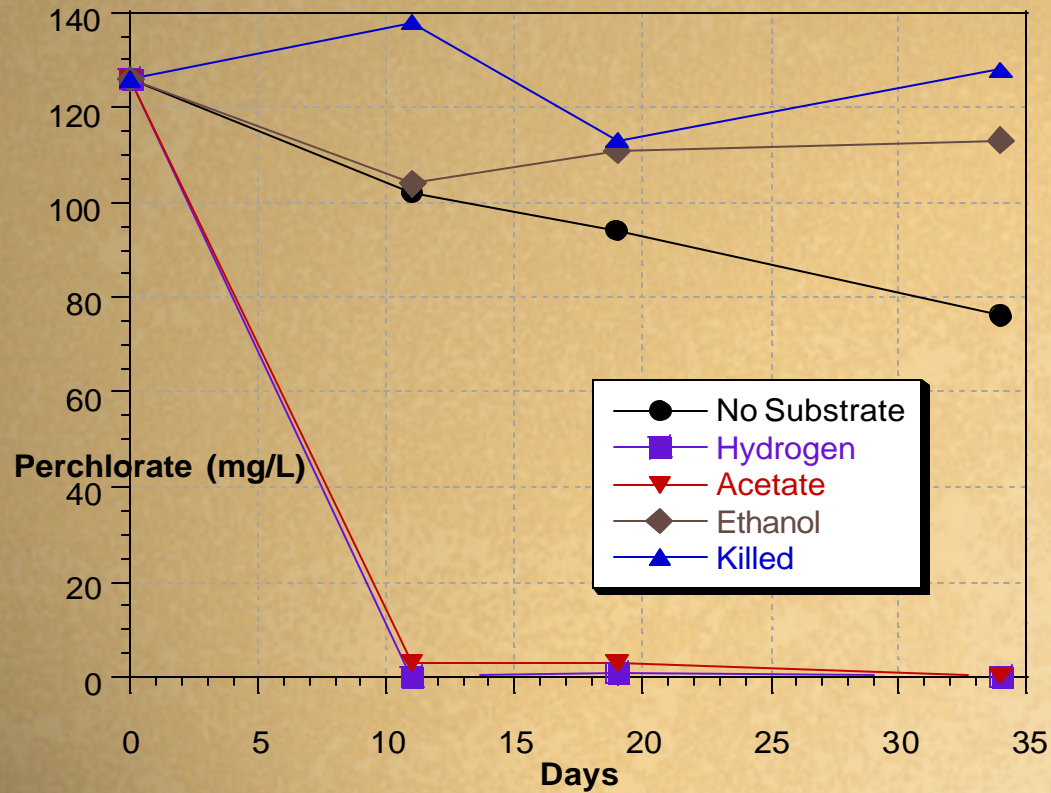
Direct push equipment



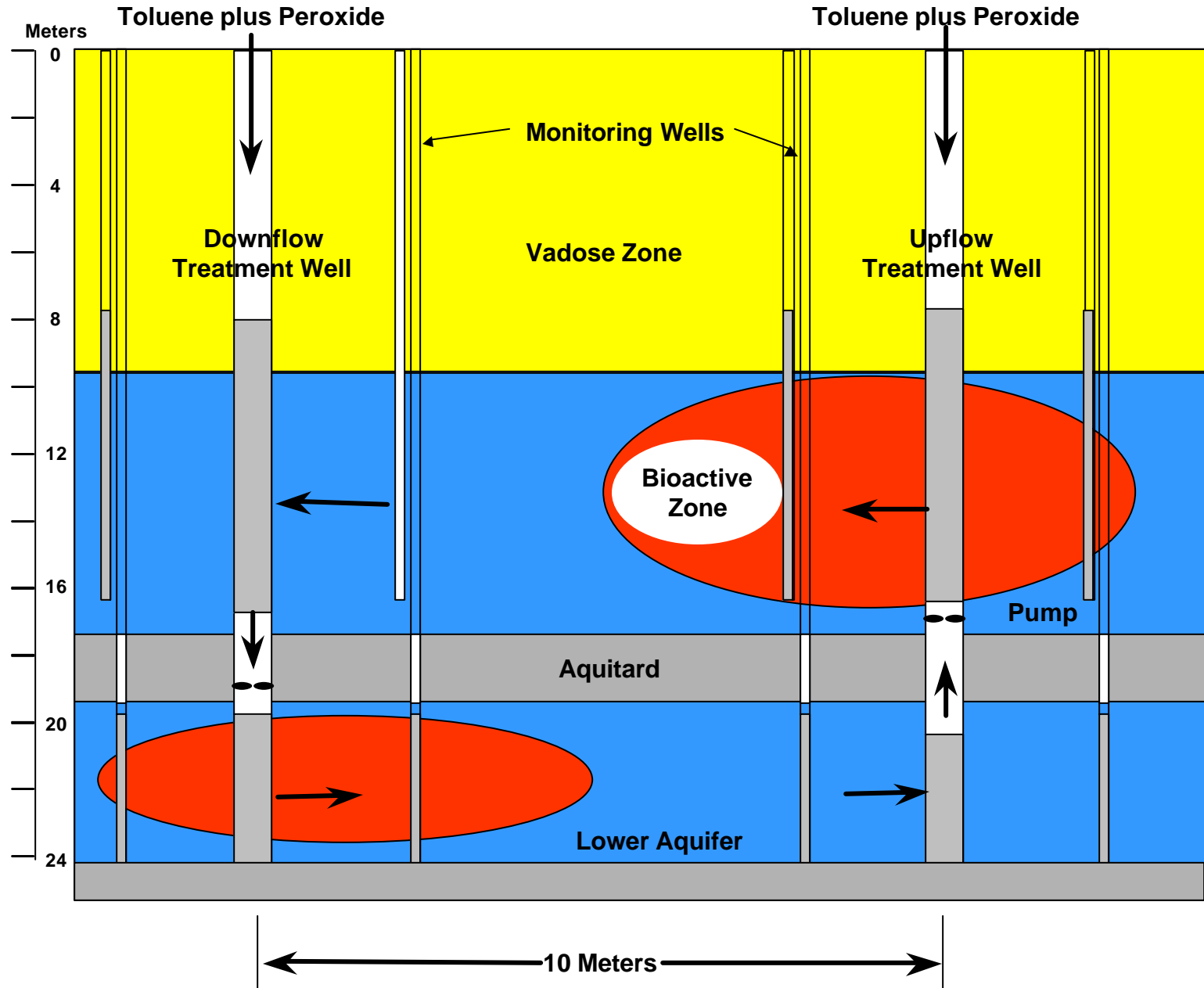
> EXPECT MORE.

Microcosm Bench Testing

Perchlorate Biodegradation in Aquifer Microcosms from Indian Head NSWC, Bldg 1170 Site



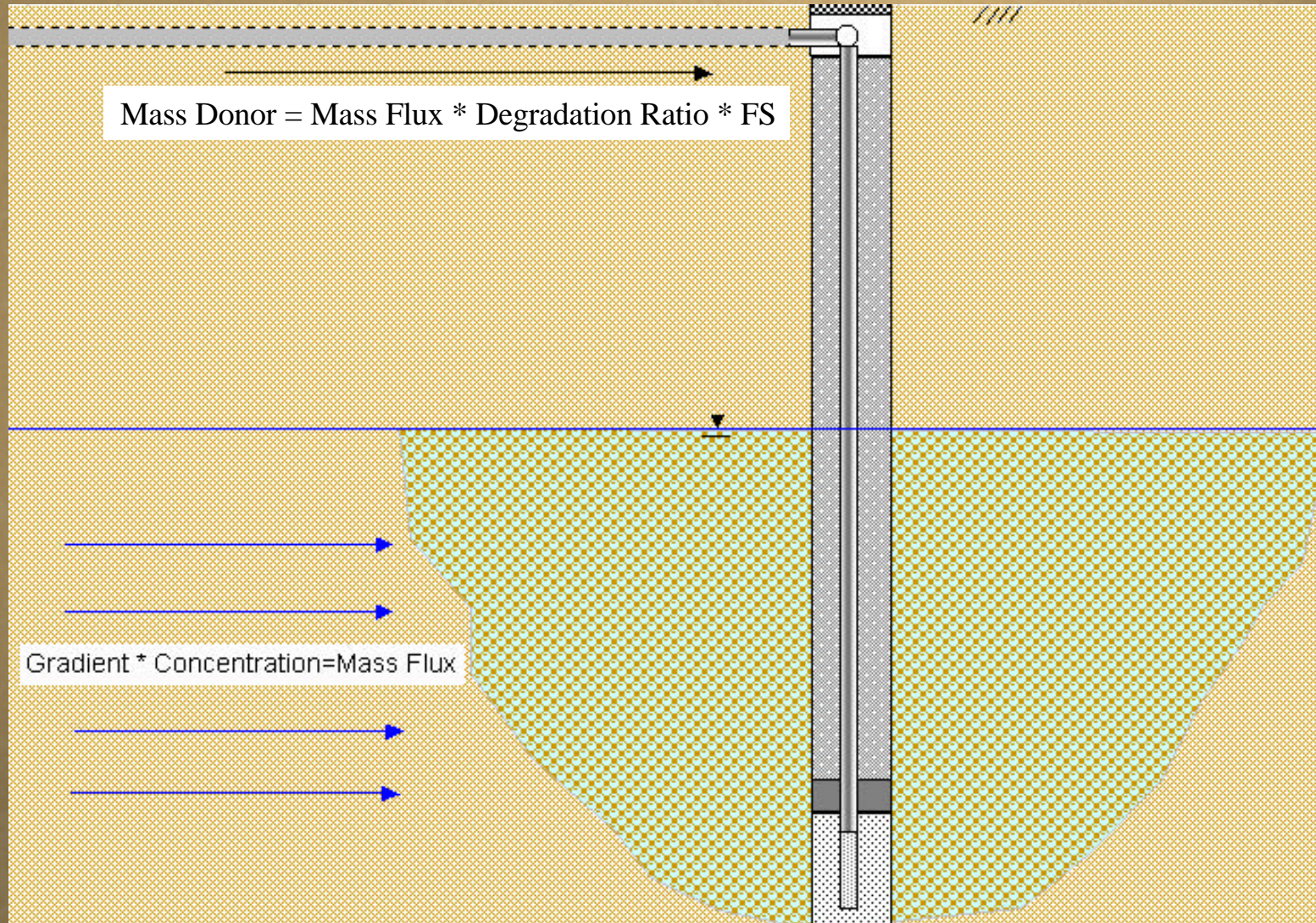
BIOREMEDIATION CONCEPT AT EDWARDS AIR FORCE BASE





> EXPECT MORE.

Approach to Engineering Plume Control





The Case for Vapor-Amended Bioremediation

- Diffuses well though heterogeneous soils
- Can penetrate tight soils
- Low carbon build-up
- Virtually eliminates biofouling and scaling problems
- Can be adapted to changes in water levels or groundwater velocities
- Straightforward monitoring and results

Proprietary

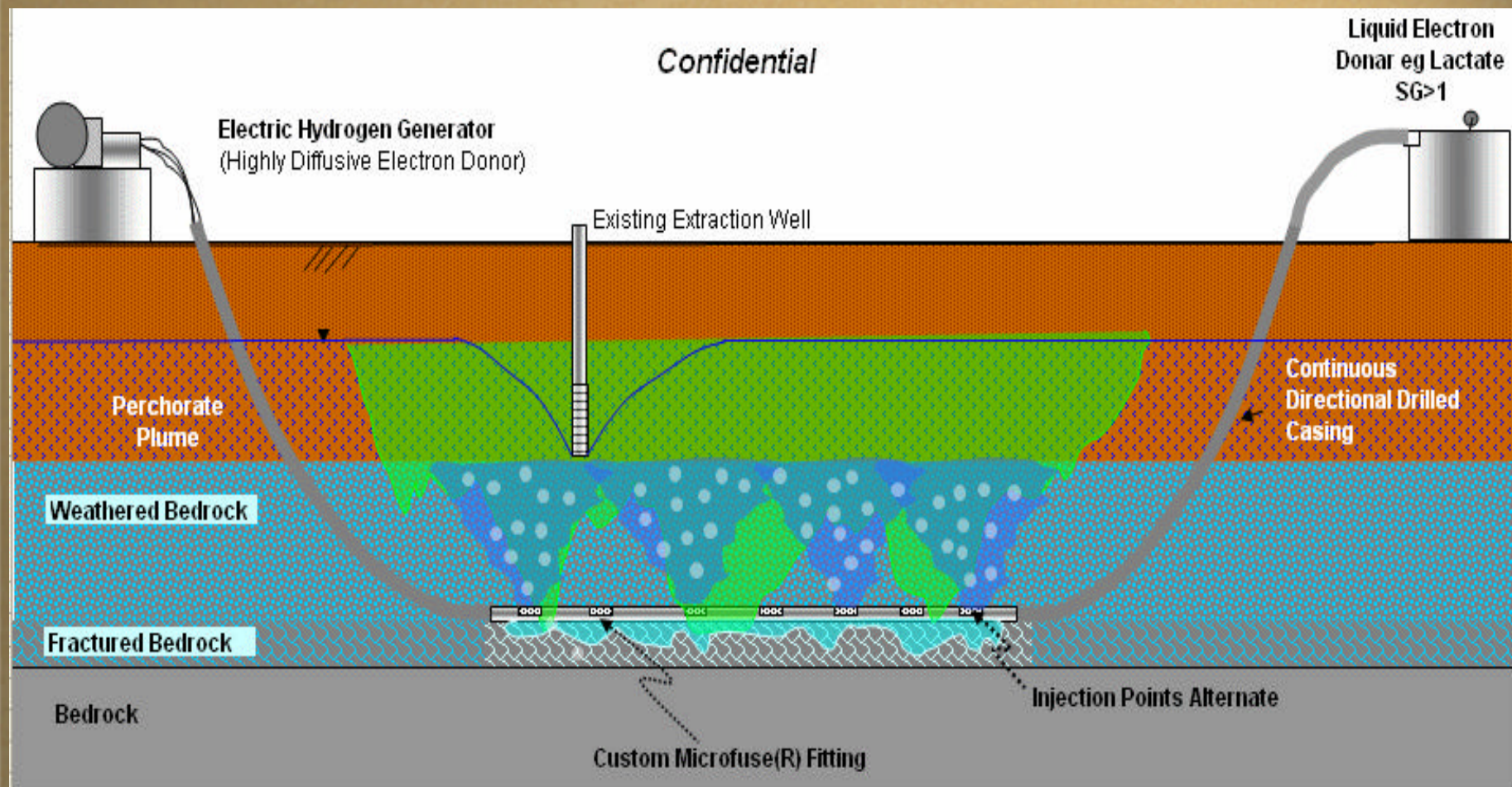
> EXPECT MORE.



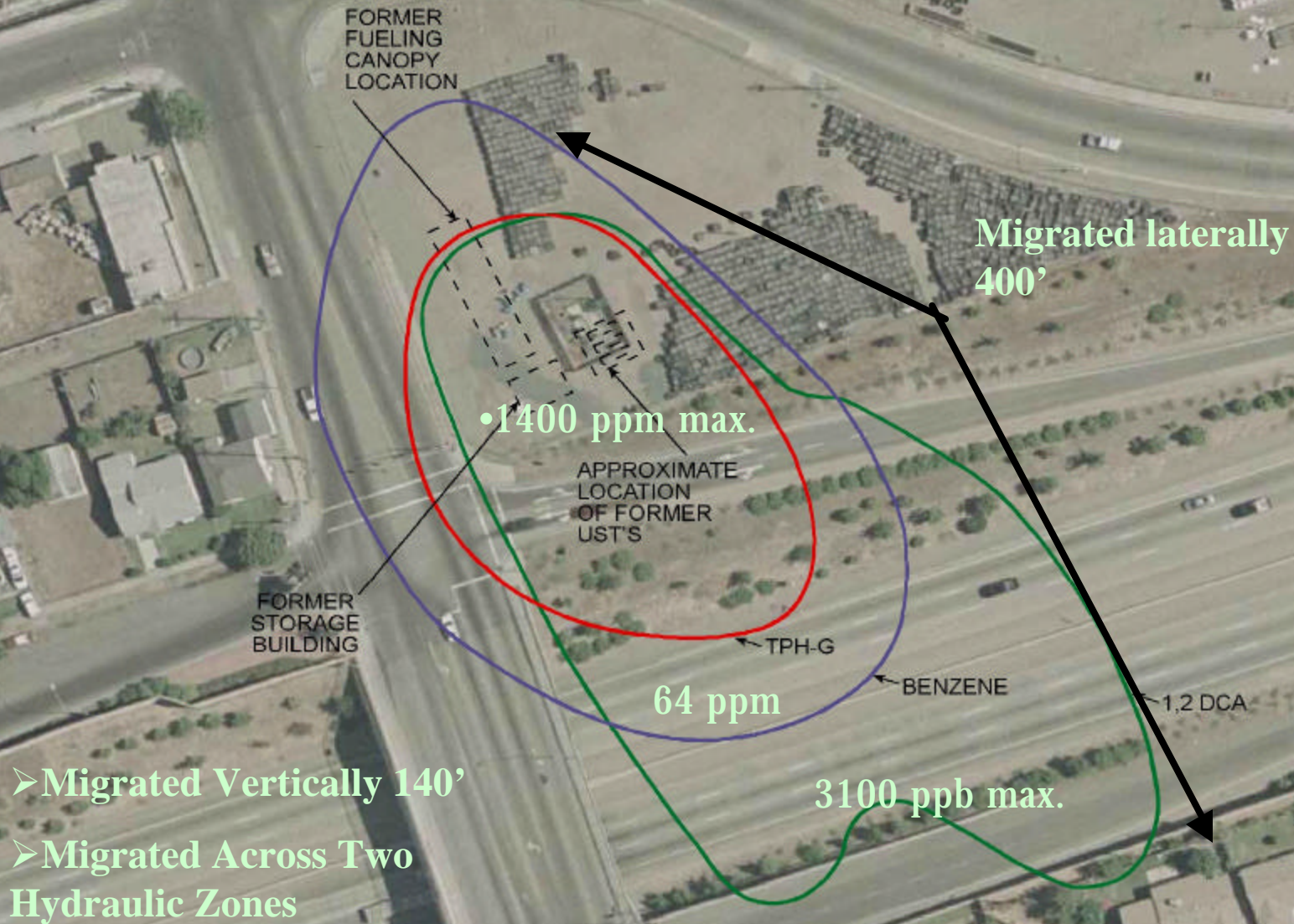
KLEINFELDER

AN EMPLOYEE OWNED COMPANY

Conceptual Stringfellow Approach



HDD is Inexpensive, Fast, and Easily Implemented



Highest Concentrations from 1997 to 2004

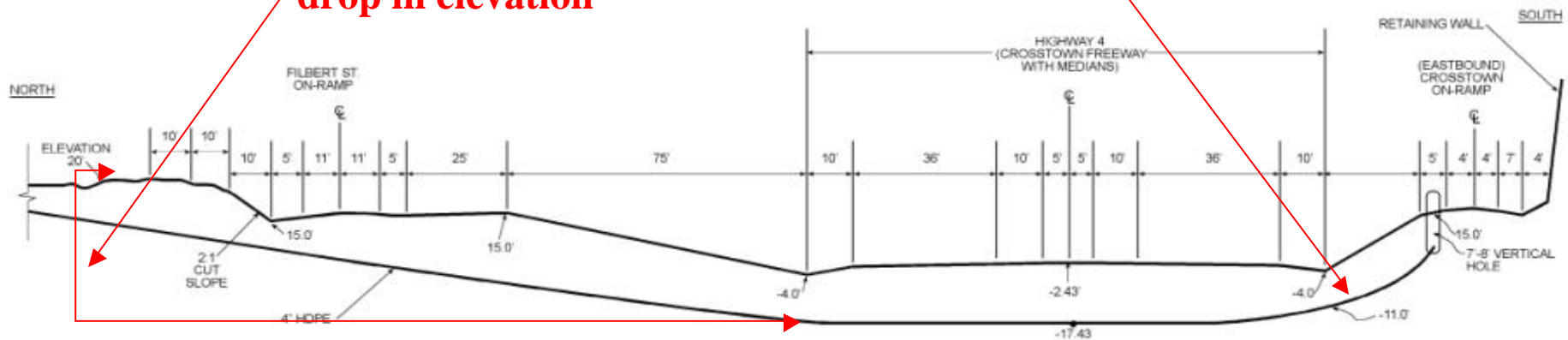


> EXPECT MORE.

Example of HDD Used In Remediation for Del Monte Foods

Approximately 35 ft
drop in elevation

Steep 35% grade increase
during last 25 ft





Summary of Advantages of Horizontal BioSparging

- Complete horizontal cut-off of perchlorate plume
- Minimal footprint, no trenching, no surface interference
- *Microfuse* fitting would provide efficient and reliable gaseous donor delivery in tight soils or fractured bedrock
- Independently controlled sparge heads for maximum flexibility in response and optimization
- Outer casing for low pressure liquid donor delivery
- Installed for a fraction of the cost of vertical extraction wells
- Very low maintenance- one well, one mixer, minimal consumables

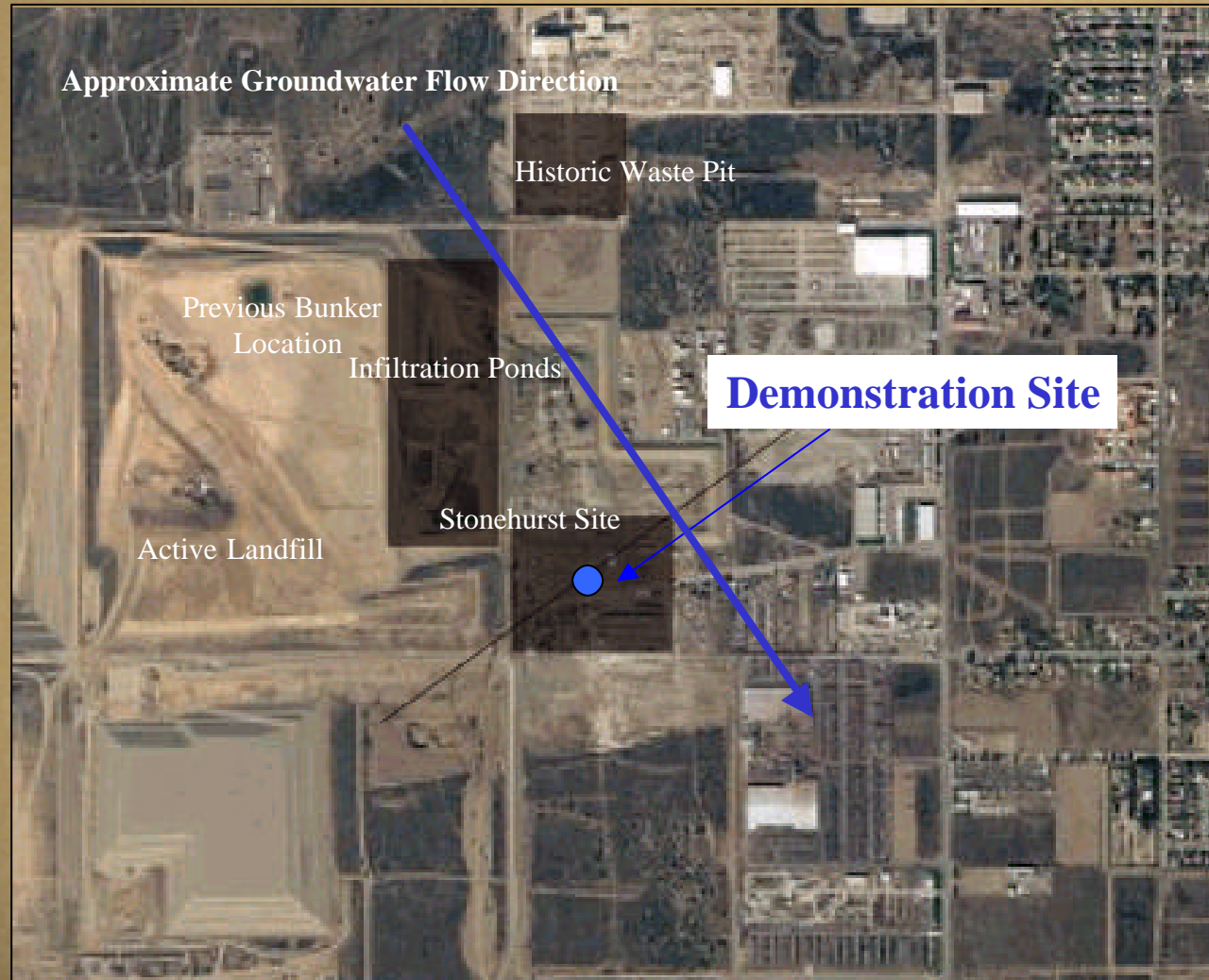


KLEINFELDER

AN EMPLOYEE OWNED COMPANY

> EXPECT MORE.

Conceptual Location for Demonstration Project



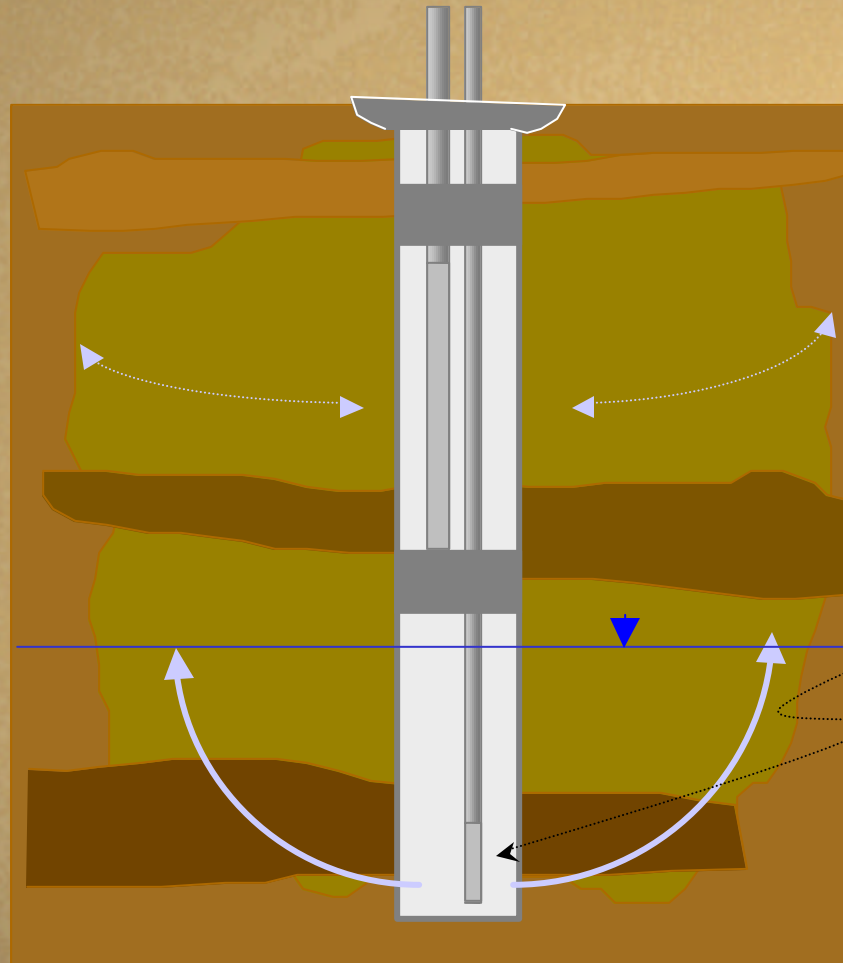


KLEINFELDER

AN EMPLOYEE OWNED COMPANY

> EXPECT MORE.

Demonstration Project Test Well





Demonstration Project Conceptual Details

- Install one dual-nested vertical well to test amended bioparging and soil remediation
- Extract effluent to monitor vadose zone bioremediation or install a probe
- Install new monitoring well(s), or place test well near existing monitoring well to test influence in groundwater/soil
- Investigate soil contamination profile with demonstration project soil boring(s)
- Run test for approximately 6 months
- Will provide data for approaches involved with all three target areas



Project Execution Strategy and Schedule

- Submit Letter Feasibility Study- within 6 weeks of Approval to Proceed
- Submit Demonstration Project Letter Workplan- Approximately 4 weeks from Feasibility Study Approval
- Install Demonstration System and Submit Letter Startup Report- Approximately 6-10 weeks from Letter Workplan Approval
- Submit Monthly Progress Reports
- Submit Final Demonstration Project Report including conclusion and recommendations- Approximately 4-6 weeks following completion of Demonstration Project



KLEINFELDER

AN EMPLOYEE OWNED COMPANY

> EXPECT MORE.

Questions?